UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX LABORATORY
1337 S. 46TH STREET BLDG 201
RICHMOND, CA 94804-4698

MEMORANDUM

SUBJECT: Field Audit Report
Groundwater Monitoring Program, George Air Force Base, CA

FROM: Greg Nagle, Environmental Scientist
EPA Region 9 Laboratory (PMD-2)

THROUGH: Brenda Bettencourt, Director
EPA Region 9 Laboratory (PMD-2)

TO: James Chang, Remedial Project Manager
Superfund Division (SFD-8-1)

Attached is a split sample report for sampling performed the week of April 10th, 2006. This report details observation made during the groundwater sample collection process.

If there are further questions concerning this field-sampling audit, please call Greg Nagle at (510) 412-2334.

ATTACHMENT: Field Audit Report

George Air Force Base
Basewide Groundwater Monitoring Program
April 2006
Field Audit Report

Introduction:
On April 10th , 11th, and 12th of 2006, Greg Nagle of the USEPA Region 9 Laboratory Field and Biology (FAB) team performed a field audit of groundwater sampling procedures in support of the George Air Force Base Groundwater Monitoring Program. Mr. Nagle also obtained split samples during the course of the field audit. The EPA FAB team conducted the field audit and split sampling in accordance with the following documents:

Basewide Sampling and Analysis Plan (SAP), George Air Force Base, California HydroGeoLogic 1998.

Final 2003 Annual Sampling and Analysis Plan (SAP) Addendum Basewide Groundwater Monitoring Events, Operable Units 1, 2, and 3 George Air Force Base, California MWH Americas, Inc. July 2003.

Final Split Sampling Plan (SSP) Basewide Groundwater Monitoring Program, George Air Force Base, Victorville, California. (EPA Region 9 Field and Biology Team, April, 2006.)

The FAB team identifies deviations from the project planning documents referenced above as findings in accordance with the following criteria:

1. Procedure not performed as specified in plan.
2. Procedure performed inconsistent with procedure specified in plan.
3. Appropriate procedure performed, procedure not specified in plan.
4. Inappropriate procedure performed.

Audit Participants:

Project Management
Sam Grizzle – Site Manager, Montgomery Watson Harza (MWH)

Field Support Personnel
Cole Munson – Principal Owner/Lead Sampler, M&M Environmental
Marlin Ellis – Sampler, M&M Environmental

EPA Auditors
Greg Nagle – USEPA Region 9 Laboratory
Joe Eidelberg – UESPA Region 9 Quality Assurance Office (QAO)

The EPA auditors observed sampling procedures and obtained split samples at the following locations as specified in the SSP.

Well ID	Parameters	Description
FT-03	VOCs	OU 1/OU 3/FT-19 Upper Aquifer
MW-49	VOCs	OU 2/OU 3 Upper Aquifer
MW-69	VOCs	OU 2/OU 3 Upper Aquifer
NZ-27	VOCs	OU 1 Upper Aquifer
NZ-89	OCPs	OU 3 Upper Aquifer
NZ-107	VOCs, LF Surrogates	OU 1/OU 3 Lower Aquifer - Landfill
WZ-06	VOCs, Nat Att. Par	OU 3/Site OT-51 Upper Aquifer

Notes:
VOCs – Volatile Organic Compounds
LF – Landfill Surrogates (i.e., Chloride, Nitrate, Sulfate)
Nat Att. Par. – Natural Attenuation Parameters (Total Organic Carbon, Alkalinity, Nitrate, Total Dissolved Solids)
OCPs – Organochlorine Pesticides

Procedures

M&M collected all samples using the same portable submersible pump and control box. M&M calibrated field instruments, calculated purge volumes, followed sample collection/preservation protocols, and performed necessary decontamination procedures in between wells as specified in the planning documents. In so doing, M&M was able to collect sample from 3-4 wells per day.

MWH provided M&M with direction, answered questions, and reviewed paperwork during the course of sampling activities to ensure efficiency and adherence to plan specifications. MWH packed the coolers, filled out air bills, and delivered samples for overnight delivery. The laboratory received all samples within 24 hours of collection, at 4° C without incident.

Photographs, field logs, and chain-of-custody information gathered during the course of audit activities are presented as Exhibit A, B, and C respectively. Identified below are general and specific audit findings with recommendations for corrective action. None of the findings listed impact sample integrity.

General Findings:

1. The projects' contract laboratory, Applied Physics and Chemistry Labs (APCL), Chino California unexpectedly announced it would no longer accept samples for environmental analysis effective April 1st, 2006. MWH is sending samples to EMAX Laboratories, Torrance, California. MWH reportedly audited EMAX within the last year for other projects. EMAX has experience with the US Air Force analytical requirements and data deliverables.

2. One field team (2 employees') of M&M Environmental unexpectedly quit immediately prior to the field audit. At the time of the field audit, M&M Environmental employed one very experienced sampler and one sampler in training.

Specific Findings:

1. Field personnel failed to perform a calibration check for well stabilization parameters (i.e., pH, conductivity, turbidity and dissolved oxygen) at the end of the day on April 10th, 2006 as specified in Section 7.1.1.1 of the Basewide SAP (HydroGeologic, 1998).

2. At MWH's direction, field support personnel did not purge well WZ-06 using the Micro-Purge/Modified Micro-Purge procedure specified in section 6.1.1.1.2 of the Basewide SAP (HydroGeologic, 1998). Instead, MWH directed field personnel to place the pump one foot from the bottom of the well, and pump at a rate of approximately 1.5 gallons per minute (gpm) to purge roughly 75 gallons. When the water level recovered, pumping continued at a rate of approximately 0.25 gpm. Sample collection occurred upon stabilization of field parameters as specified 7.1 of the Basewide SAP Addendum (MWH, 2003). MWH modified this purge technique based on experience and data generated from previous sampling events.

3. The EPA QAO did not provide performance evaluation samples (PES) for all the chemical testing parameters as specified in the SSP. The QAO provides PES through Quality Assurance Testing Support (QATS) Contract Laboratory in Las Vegas, Nevada. EPA and the USAF field personnel submitted PES for volatile organic compounds, nitrate, and alkalinity only. The QATS Laboratory provided a PES for total organic carbon (TOC) as requested, however the container type and chemical preservative was inconsistent with that used by the field and specified in the SSP thus compromising the "double blind" PES submission. QATS provided the PES as directed by EPA.

Recommendations:

1. MWH should perform an audit of EMAX Laboratories and communicate any project specific requirements as soon as possible. Given the recent closing of APCL, EMAX may be experiencing a significant influx of work from other projects.

2. Given the recent turnover in sampling support at M&M Environmental, and to a lesser degree Specific Finding 1, MWH should continue to provide on-site oversight support.

3. MWH should provide justification for the modified purge approach used at WZ-06 and document the procedure in an addendum to the Basewide SAP.

4. The EPA QAO should provide PES as specified in the SSP, or communicate changes with field personnel in advance of field sampling activities.

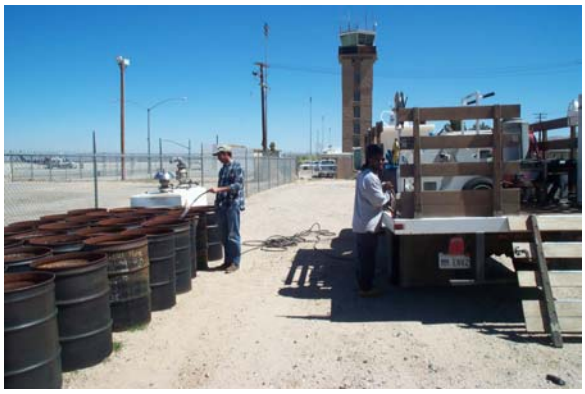
Exhibit A

Photographs

Measuring Water Depth

Setting the Pump

Collecting Sample



Disposing Purge/Decon Water

Exhibit B

Field Logs

MWH

FIELD REPORT

Date: 4/16/06	Job No.: 195102.8
Project: LTGWM	
Location: GATB	
Weather: Clear and Cool	
Present at Site: MUNSON - ELLIS - GRIZZLE GREG NAGLE SOL EIDELBERG	

Calibration Fluid Manufacturer and Lot#: 4974
AUTO CAL SOLUTION
EXP 07-05-07

	Actual Value	Beginning Calibration	Ending Calibration
Calibration Time:	—	0825	
pH (SU)	4.0	3.98	
EC (ms/cm)	4.49	4.46	
Turbidity (NTU)	0	0	
Dissolved Oxygen (mg/L)	N/A	11.85	

0750 Arrived at NZ-108
0800 Collected Equip rinsate
0825 Started well Purge
0855 parameters Stable, Collect Sample and start decon

1000 Decon Complete Depart NZ-108

1005 Arrived at NZ-107
1040 Started well purge at .26 GPM
1115 Collected samples - split Samples with EPA
1120 Started decon
1230 Decon Complete - depart NZ-107
1405 Collect Sample - Start decon
1500 Decon Complete, Departed NZ-60 to treatment plant to transfer water

PAGE ____ OF ____

PREPARED BY: _____

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MONTGOMERY WATSON HARZA

MONITORING WELL SAMPLING LOG

Page 1 of 1

All measurements taken from: [X] Top of Casing [ ] Protective Casing [ ] Ground Level Sample ID NZ-60-WG

Well Number NZ-60
Date 4/10/06
Time Start: 1310 End: 1405
Client AFCEE
Project George AFB Basewide Groundwater Monitoring
Sampler(s) MUNSON - LLL. S
Well Diameter 4" Borehole Diameter 8"
Screen interval 274.5 - ~~279~~ 294.5
Pump Depth (ft) 280.46

Static Water Level (ft) 265.92
Depth to Product (ft) N/A
Total Well Depth (ft) 295.0'
Standing Water Column (ft) 29.08
Purging Method Modified Micropurge
Purging Equipment 2" Grundfos Rediflow
Water Level Equipment Solinst
Field Parameter Meter HORIBA U-22
ORP Meter HANNA

FIELD PARAMETERS MEASURED

TIME	AMOUNT PURGED (gallons)	Purge Rate (gpm)	5% EC (mS/cm)	1% pH	5% Temp (°C)	10% or <10 Turbidity (NTU)	5% ORP (mv)	10% DO (mg/L)	Water Level (ft)
1310	Started well purge at .29 GPM								266.23
1315	3.79	.30	.790	7.64	21.6	238	244	6.86	266.12
1320	5.38	.26	.802	7.64	22.6	149	243	6.58	266.09
1325	6.65	.27	.802	7.63	23.1	106	240	6.37	266.11
1330	8.02	.28	.804	7.64	23.3	97	245	6.31	266.11
1335	9.39	.28	.807	7.64	23.7	81	244	6.30	266.11
1340	10.94	.29	.811	7.64	24.2	50	240	5.82	266.11
1345	12.29	.29	.812	7.64	24.0	33	244	5.87	266.11
1350	13.46	.22	.814	7.64	23.7	18	242	5.84	266.11
1355	14.44	.21	.815	7.64	22.7	11	244	5.87	266.11
1400	15.22	.20	.816	7.64	22.5	4	242	5.88	266.11
1405	Collect Sample								

FIELD SCREENING ANALYSIS

Parameter	Method/Instrument	Measurement 1	Measurement 2	Average Measurement	Date/Time	Sampler
H_2S						
Fe^{2+}						

OBSERVATIONS OF GROUNDWATER SAMPLES

Color: (Clear) Other (describe):

Odor: (None) Low Medium High Fuel-like Other (describe):

Comments:

12-01 GAFB

MWH
MONTGOMERY WATSON HARZA

MONITORING WELL SAMPLING LOG

Page 1 of 1

All measurements taken from: ☒ Top of Casing ☐ Protective Casing ☐ Ground Level Sample ID NZ-108-WG-

Well Number NZ-108
Date 4/10/06
Time Start: 0825 End: 0855
Client AFCEE
Project George AFB Basewide Groundwater Monitoring
Sampler(s) Munson - Ellis
Well Diameter 4" Borehole Diameter 16"
Screen Interval 258.0' - 278.0'
Pump Depth (ft) 272.85

Static Water Level (ft) 265.70
Depth to Product (ft) N/A
Total Well Depth (ft) 280.0'
Standing Water Column (ft) 14.30'
Purging Method Modified Micropurge
Purging Equipment 2" Grundfos Rediflow
Water Level Equipment Solinst
Field Parameter Meter Horiba U-10
ORP Meter Hanna

FIELD PARAMETERS MEASURED

TIME	AMOUNT PURGED (gallons)	Purge Rate (gpm)	EC (mS/cm) 5%	pH 1%	Temp (°C) 5%	Turbidity (NTU) 10% or <10	ORP (mv) 5%	DO (mg/L) 10%	Water Level (ft)
0825	Start well purge at .33 GPM								265.70
0830	5.27	.33	.535	7.74	23.3	5	179	6.59	267.20
0835	6.33	.33	.534	7.93	23.8	4	181	6.29	269.56
0840	7.51	.26	.532	8.06	24.1	4	182	5.86	270.22
0845	7.99	.14	.534	8.04	24.1	3	181	5.81	269.72
0850	8.42	.14	.534	8.06	23.7	3	187	5.85	269.98
0855	Collect Sample								

FIELD SCREENING ANALYSIS

Parameter	Method/Instrument	Measurement 1	Measurement 2	Average Measurement	Date/Time	Sampler
H_2S						
Fe^{2+}						

OBSERVATIONS OF GROUNDWATER SAMPLES

Color: (Clear) Other (describe):

Odor: (None) Low Medium High Fuel-like Other (describe):

Comments:

12-01 GAFB

MWH
MONTGOMERY WATSON HARZA

MONITORING WELL SAMPLING LOG

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All measurements taken from: ☒ Top of Casing ☐ Protective Casing ☐ Ground Level Sample ID NZ-107-WG

Well Number NZ-107
Date 4/18/06
Time Start: 1040 End: 1115
Client AFCEE
Project George AFB Basewide Groundwater Monitoring
Sampler(s) Marston - Ellis
Well Diameter 4" Borehole Diameter 8"
Screen Interval 260.8' - 250.8'
Pump Depth (ft) 268.35

Static Water Level (ft) 256.70
Depth to Product (ft) N/A
Total Well Depth (ft) 280.8'
Standing Water Column (ft) 23.30
Purging Method Modified Micropurge
Purging Equipment 2" Grundfos Rediflow
Water Level Equipment Solinst
Field Parameter Meter HORIBA U-10
ORP Meter HANNA

FIELD PARAMETERS MEASURED

TIME	AMOUNT PURGED (gallons)	Purge Rate (gpm)	5% EC (mS/cm)	1% pH	5% Temp (°C)	10% or <10 Turbidity (NTU)	5% ORP (mv)	10% DO (mg/L)	Water Level (ft)
1040	Start well purge at .26 gpm								257.50
1045	3.41	.27	.748	7.28	19.8	6	257	7.20	258.25
1050	4.75	.27	.786	7.70	21.6	6	213	7.18	258.45
1055	5.18	.27	.819	7.71	22.1	6	240	6.53	258.22
1100	6.40	.22	.822	7.72	23.5	7	255	6.51	258.22
1105	7.33	.20	.823	7.73	22.7	7	258	6.44	258.15
1110	8.26	.21	.821	7.73	23.0	7	251	6.49	258.13
1115	Collect Sample								

FIELD SCREENING ANALYSIS

Parameter	Method/Instrument	Measurement 1	Measurement 2	Average Measurement	Date/Time	Sampler
H_2S						
Fe^{2+}						

OBSERVATIONS OF GROUNDWATER SAMPLES

Color: (Clear) Other (describe):

Odor: (None) Low Medium High Fuel-like Other (describe):

Comments:

12-01 GAFB

MWH

FIELD REPORT

Date: 4/11/06 | Job No.: 19518.48

Project: LTG-Main

Location: GIFB

Weather: Cloudy - Cool

Present at Site: MUNSON - ELLIS

AUTO

Calibration Fluid Manufacturer and Lot#: 4974

AUTOCAL SOLUTION EXP 7/5/07

	Actual Value	Beginning Calibration	Ending Calibration
Calibration Time:	—	0815	1525
pH (SU)	4.0	3.99	3.96
EC (ms/cm)	4.49	4.50	4.48
Turbidity (NTU)	0	0	0
Dissolved Oxygen (mg/L)	—	12.05	9.83

0745 arrived at FT-03

0810 Collected Equip Blank

0820 Started well purge @ .25GPM

0850 Collect'd sample Start Decon

1005 Decon Complete - Depart FT-03 for N2-89

1015 arrived at N2-89

1040 Started well purge @ .48 Gpm

1110 Collected Sample - EPA Split

1215 Decon Complete - Departed N2-89 to treatment plant to dump purge water

1225 arrived at treatment plant - began purge water discharge

1245 discharge complete Departed trmt. plant for MW69

1315 arrived at MW69

1425 Began Well purge - MW69

1500 Collect Sample - Start Decon

PAGE ____ OF ____

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MONITORING WELL SAMPLING LOG

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All measurements taken from: ☒ Top of Casing ☐ Protective Casing ☐ Ground Level Sample ID FT-03-WG

Well Number FT-03
Date 4/11/06
Time Start: 0820 End: 0850
Client AFCEE
Project George AFB Basewide Groundwater Monitoring
Sampler(s) MUNSON - ELLIS
Well Diameter 4" Borehole Diameter 8"
Screen Interval 133.5' - 168.5'
Pump Depth (ft) 141.05

Static Water Level (ft) 113.60
Depth to Product (ft) N/A
Total Well Depth (ft) 168.5'
Standing Water Column (ft) 54.9'
Purging Method Modified Micropurge
Purging Equipment 2" Grundfos Rediflow
Water Level Equipment Solinst
Field Parameter Meter HORIBA U-10
ORP Meter HANNA

FIELD PARAMETERS MEASURED

TIME	AMOUNT PURGED (gallons)	Purge Rate (gpm)	5% EC (mS/cm)	1% pH	5% Temp (°C)	10% or <10 Turbidity (NTU)	5% ORP (mv)	10% DO (mg/L)	Water Level (ft)
0820		Started well purge @ .26 GPM							
0825	2.02	.25	.581	7.90	18.7	3	240	6.82	113.80
0830	3.51	.26	.587	8.19	20.1	4	240	6.35	113.75
0835	4.65	.26	.587	8.27	20.5	4	241	6.35	113.75
0840	6.32	.26	.587	8.28	20.8	4	241	6.33	113.75
0845	7.86	.27	.587	8.28	21.0	5	242	6.35	113.76
0850	Collect Sample								

FIELD SCREENING ANALYSIS

Parameter	Method/Instrument	Measurement 1	Measurement 2	Average Measurement	Date/Time	Sampler
H_2S						
Fe^{2+}						

OBSERVATIONS OF GROUNDWATER SAMPLES

Color: (Clear) Other (describe):
Odor: (None) Low Medium High Fuel-like Other (describe):
Comments:

12-01 GAFB

MWH
MONTGOMERY WATSON HARZA

MONITORING WELL SAMPLING LOG

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All measurements taken from: ☒ Top of Casing ☐ Protective Casing ☐ Ground Level Sample ID NZ-89-WG

Well Number NZ-89
Date 04-11-06
Time Start: 1040 End: 1110
Client AFCEE
Project George AFB Basewide Groundwater Monitoring
Sampler(s) MUNSON-ELLIS
Well Diameter 4" Borehole Diameter 8"
Screen Interval 108' – 128.5
Pump Depth (ft) 125.11

Static Water Level (ft) 121.72
Depth to Product (ft) N/A
Total Well Depth (ft) 128.5
Standing Water Column (ft) 6.78'
Purging Method Modified Micropurge
Purging Equipment 2" Grundfos Rediflow
Water Level Equipment SOLINST
Field Parameter Meter HORIBA U-10
ORP Meter HANNA

FIELD PARAMETERS MEASURED

TIME	AMOUNT PURGED (gallons)	Purge Rate (gpm)	EC (mS/cm) 5%	pH 1%	Temp (°C) 5%	Turbidity (NTU) 10% or <10	ORP (mv) 5%	DO (mg/L) 10%	Water Level (ft)
1040	Start well purge at					.48	Gpm		121.72
1045	4.43	.40	7.91	7.92	18.6	11	266	6.39	121.75
1050	6.72	.27	~~9.92~~ 9.58	7.92	20.5	9	232	6.03	121.73
1055	8.84	.27	9.58	7.93	21.3	10	237	5.88	121.75
1100	10.80	.40	.963	7.94	21.3	10	237	5.83	121.75
1105	12.13	.36	.962	7.94	21.3	8	239	5.85	121.75
1110	Collect Sample								

FIELD SCREENING ANALYSIS

Parameter	Method/Instrument	Measurement 1	Measurement 2	Average Measurement	Date/Time	Sampler
H_2S						
Fe^{2+}						

OBSERVATIONS OF GROUNDWATER SAMPLES

Color: (Clear) Other (describe):

Odor: (None) Low Medium High Fuel-like Other (describe):

Comments:

12-01 GAFB

MWH
MONTGOMERY WATSON HARZA

MONITORING WELL SAMPLING LOG

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All measurements taken from: ☐ Top of Casing ☐ Protective Casing ☐ Ground Level Sample ID MW-69-0406

Well Number MW-69
Date 4/11/06
Time Start: 1425 End: 1500
Client AFCEE
Project George AFB Basewide Groundwater Monitoring
Sampler(s) MUNSON - ELLIS
Well Diameter 4" Borehole Diameter 12"
Screen Interval 120' - 140'
Pump Depth (ft) ~~139.5~~ 130.7

Static Water Level (ft) 125.70
Depth to Product (ft) N
Total Well Depth (ft) 140
Standing Water Column (ft) 14.3
Purging Method Modified Micropurge
Purging Equipment 2" Grundfos Rediflow
Water Level Equipment Solinst
Field Parameter Meter HORIBA U-10
ORP Meter HANNA

FIELD PARAMETERS MEASURED

TIME	AMOUNT PURGED (gallons)	Purge Rate (gpm)	5% EC (mS/cm)	1% pH	5% Temp (°C)	10% or <10 Turbidity (NTU)	5% ORP (mv)	10% DO (mg/L)	Water Level (ft)
1425	Began well purge @ .32 GPM								
1430	3.96	.32	1.17	7.90	20.2	25	258	5.30	125.95
1435	4.72	.30	1.18	7.84	20.7	12	252	4.35	125.82
1440	5.49	.28	1.17	7.82	21.7	11	242	4.55	125.95
1445	7.01	.26	1.18	7.80	22.5	18	240	4.59	125.95
1450	8.54	.26	1.18	7.79	23.2	13	241	4.47	125.95
1455	9.63	.21	1.18	7.79	23.6	8	240	4.40	125.95
1500	Collect Sample								

FIELD SCREENING ANALYSIS

Parameter	Method/Instrument	Measurement 1	Measurement 2	Average Measurement	Date/Time	Sampler
H_2S						
Fe^{2+}						

OBSERVATIONS OF GROUNDWATER SAMPLES

Color: (Clear) Other (describe):

Odor: (None) Low Medium High Fuel-like Other (describe):

Comments:

12-01 GAFB

MWH

FIELD REPORT

Date: 4/12/06 Job No.: 195148

Project: LT GWM

Location: BATF

Weather: Clear-Cool

Present at Site: MUNSON - ELLIS

Calibration Fluid Manufacturer and Lot#: 4974

AutoCal Exp. 07-05-07

	Actual Value	Beginning Calibration	Ending Calibration
Calibration Time:	—	0740	1530
pH (SU)	4.0	3.95	3.99
EC (ms/cm)	4.69	4.57	4.48
Turbidity (NTU)	0	0	0
Dissolved Oxygen (mg/L)	—	1139	8.90

0815 arrived at WZ-06

0845 Started well purge at 1.4 GPM Will purge 75 GAL or until well pumps dry.

0955 pumped 75 gal. Reset pump to 121' and restarted purge at normal purge rate

1015 Collected sample - Start decon

1115 Decon Complete - Depart WZ-06

1230 arrived at MW 49 - Started decon

1435 Decon Complete lowered pump to 142.30

1445 Started well purge

1515 Collect Sample - Start decon

PAGE 1 OF 1

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MWH MONTGOMERY WATSON HARZA

MONITORING WELL SAMPLING LOG

Page 1 of ____

All measurements taken from: ☒ Top of Casing ☐ Protective Casing ☐ Ground Level Sample ID WZ-06-WG

Well Number WZ-06	Static Water Level (ft) 113.35
Date 4/12/06	Depth to Product (ft) N/A
Time Start: 0845 End: 1015	Total Well Depth (ft) 133.0
Client AFCEE	Standing Water Column (ft) 20.0
Project George AFB Basewide Groundwater Monitoring	Purging Method Modified Micropurge
Sampler(s) MUNSON-ELLIS	Purging Equipment 2" Grundfos Rediflow
Well Diameter 4" Borehole Diameter 8"	Water Level Equipment SOLINST
Screen Interval 113.0' - 133.0'	Field Parameter Meter HORIBA U-10
Pump Depth (ft) 132.0' / 123	ORP Meter HANNA

FIELD PARAMETERS MEASURED

TIME	AMOUNT PURGED (gallons)	Purge Rate (gpm)	5% EC (mS/cm)	1% pH	5% Temp (°C)	10% or <10 Turbidity (NTU)	5% ORP (mv)	10% DO (mg/L)	Water Level (ft)
0845	Started well purge @ 1.46 gpm								113.35
0855	20.0	1.47	.592	7.06	23.1	32	228	2.48	115.87
0910	32.5	1.45	.583	7.83	23.7	20	221	2.36	115.65
0920	57.70	1.46	.584	7.95	23.9	17	227	2.10	116.02
0935	74.66	1.46	.585	7.98	24.0	20	228	2.14	116.14
		ON							
0950	Restarted well purge @ .22 GPM								
0955	1.50	.23	.584	8.03	22.8	12	142	2.18	114.02
1000	2.85	.21	.586	8.00	22.6	14	180	2.29	113.92
1005	3.87	.22	.582	7.99	23.4	14	192	2.19	113.92
1010	4.35	.22	.584	7.98	23.6	14	192	2.16	113.92
1015	Collect Samples								

FIELD SCREENING ANALYSIS

Parameter	Method/Instrument	Measurement 1	Measurement 2	Average Measurement	Date/Time	Sampler
H_2S						
Fe^{2+}						

OBSERVATIONS OF GROUNDWATER SAMPLES

Color: Clear Other (describe):

Odor: None Low Medium High Fuel-like Other (describe):

Comments: Pump placed one foot from bottom of well

12-01 GAFB

MWH

MONITORING WELL SAMPLING LOG

Page 1 of 1

All measurements taken from: ☒ Top of Casing ☐ Protective Casing ☐ Ground Level Sample ID _____

Well Number MW-49
Date 4/12/06
Time Start 1445 End: 1515
Client AFCEE
Project George AFB Basewide Groundwater Monitoring
Sampler(s) MUNSON-ELLIS
Well Diameter 4" Borehole Diameter 12"
Screen Interval 120-160
Pump Depth (ft) 142.30'

Static Water Level (ft) 137.36
Depth to Product (ft) N/A
Total Well Depth (ft) 160.0'
Standing Water Column (ft) 22.7'
Purging Method Modified Micropurge
Purging Equipment Grundfos Redflow
Water Level Equipment Solinst
Field Parameter Meter HORIBA U-10
ORP Meter HANNA

FIELD PARAMETERS MEASURED

TIME	AMOUNT PURGED (gallons)	Purge Rate (gpm)	5% EC (mS/cm)	1% pH	5% Temp (°C)	10% or <10 Turbidity (NTU)	5% ORP (mv)	10% DO (mg/L)	Water Level (ft)
1445	Started well purge @					.35	6pm		
1450	4.25	.34	.700	8.30	24.2	24	227	7.20	138.90
1455	5.51	.28	752	8.39	24.1	13	155	6.60	138.95
1500	6.96	.26	.832	8.42	24.8	9	189	6.33	138.92
1505	8.69	.26	.839	8.42	24.9	9	190	6.28	138.93
1510	9.32	.26	.834	8.43	25.1	8	191	6.31	138.95
1515	Collect Samples								

FIELD SCREENING ANALYSIS

Parameter	Method/Instrument	Measurement 1	Measurement 2	Average Measurement	Date/Time		Sampler
H_2S							
Fe^{2+}							

OBSERVATIONS OF GROUNDWATER SAMPLES

Color: (Clear) Other (describe):

Odor: (None) Low Medium High Fuel-like Other (describe):

Comments:

05-03 GAFB

MWH

GEORGE AIR FORCE BASE
SAN BERNARDINO COUNTY, CALIFORNIA
MONITORING WELL SAMPLING LOG

FIGURE B-1

Chain-of Custody Records

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case: 35220 R
Client No:

				Chain of Custody Record		Sampler Signature:	
Region:	9	Date Shipped:	4/12/2006	Relinquished By	(Date / Time)	Received By	(Date / Time)
Project Code:		Carrier Name:	FedEx	1			
Account Code:		Airbill:	8451 9656 9820	2			
CERCLIS ID:	CA2570024453	Shipped to:	EPA Region 9 Laboratory 1337 South 46th Street, Building 201 Richmond CA 94804 (510) 412-2377	3			
Spill ID:	Q7			4			
Site Name/State:	George Air Force Base/CA						
Project Leader:	Greg Nagle						
Action:	Combined RI/FS						
Sampling Co:	EPA Region 9 Laboratory						

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		QC Type
Y2FX6	Ground Water/ Greg Nagle	L/G	ALK & NO3 (21)	151 (Ice Only) (1)	MW-200	S: 4/12/2006	14:00	PE
Y2FX7	Ground Water/ Greg Nagle	L/G	ALK & NO3 (21), TOC (21)	130 (HCL), 131 (HCL), 136 (Ice Only), 137 (Ice Only), 138 (Ice Only) (5)	WZ-06	S: 4/12/2006	10:15	--

Shipment for Case Complete? N	Sample(s) to be used for laboratory QC: Y2FX7	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key: ALK & NO3 = Alkalinity & Nitrate, TOC = Total Organic Carbon	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____

TR Number: 9-265062414-041206-0002

REGION COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602

USEPA Contract Laboratory Program
Organic Traffic Report & Chain of Custody Record

Case No: 35220
DAS No:
R

Region:	9
Project Code:	
Account Code:	
CERCLIS ID:	CA2570024453
Spill ID:	Q7
Site Name/State:	George Air Force Base/CA
Project Leader:	Greg Nagle
Action:	Combined RI/FS
Sampling Co:	EPA Region 9 Laboratory

Date Shipped:	4/10/2006
Carrier Name:	FedEx
Airbill:	8451-9856-9771
Shipped to:	A4 Scientific 1544 Sawdust Road Suite 505 The Woodlands TX 77380 (281) 292-5277

Chain of Custody Record

Relinquished By	(Date / Time)	Received By	(Date / Time)
1			
2			
3			
4			

Sampler Signature:

ORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME	INORGANIC SAMPLE No.	QC Type
Y2FX1	Ground Water/ Greg Nagle	L/G	VOA (21)	112 (HCL), 113 (HCL), 114 (HCL), 115 (HCL), 116 (HCL), 117 (HCL), 118 (HCL), 119 (HCL), 120 (HCL) (9)	NZ-107	S: 4/10/2006 11:15		

Shipment for Case Complete? N	Sample(s) to be used for laboratory QC: Y2FX1	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key: VOA = CLP TCL Volatiles	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____

TR Number: 9-265062414-041006-0001

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EPA USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case: 35220
Client No:

R

Region:	9	Date Shipped:	4/10/2006
Project Code:		Carrier Name:	FedEx
Account Code:		Airbill:	8451-9856-9782
CERCLIS ID:	CA2570024453	Shipped to:	EPA Region 9 Laboratory 1337 South 46th Street, Building 201 Richmond CA 94804 (510) 412-2377
Spill ID:	Q7		
Site Name/State:	George Air Force Base/CA		
Project Leader:	Greg Nagle		
Action:	Combined RI/FS		
Sampling Co:	EPA Region 9 Laboratory		

Chain of Custody Record

Relinquished By	(Date / Time)	Received By	(Date / Time)
1			
2			
3			
4			

Sampler Signature:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME	QC Type
Y2FX1	Ground Water/ Greg Nagle	L/G	Anions & T (21)	121 (Ice Only), 122 (Ice Only), 123 (Ice Only) (3)	NZ-107	S: 4/10/2006 11:15	--

Shipment for Case Complete? N	Sample(s) to be used for laboratory QC: Y2FX1	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key: Anions & T = Anions & TDS	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced?

TR Number: 9-265062414-041006-0002

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REGION COPY

EPA USEPA Contract Laboratory Program
Organic Traffic Report & Chain of Custody Record

Case No: 35220 **R**
DAS No:

Region:	9
Project Code:	
Account Code:	
CERCLIS ID:	CA2570024453
Spill ID:	Q7
Site Name/State:	George Air Force Base/CA
Project Leader:	Greg Nagle
Action:	Combined RI/FS
Sampling Co:	EPA Region 9 Laboratory

Date Shipped:	4/11/2006
Carrier Name:	FedEx
Airbill:	8415 9856 9830
Shipped to:	A4 Scientific 1544 Sawdust Road Suite 505 The Woodlands TX 77380 (281) 292-5277

Chain of Custody Record

Relinquished By	(Date / Time)	Received By	(Date / Time)
1			
2			
3			
4			

Sampler Signature:

ORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME	INORGANIC SAMPLE No.	QC Type
Y2FW8	Ground Water/ Greg Nagle	L/G	VOA (21)	103 (HCL), 104 (HCL), 105 (HCL) (3)	FT-03	S: 4/11/2006 8:50		--
Y2FW9	Ground Water/ Greg Nagle	L/G	VOA (21)	106 (HCL), 107 (HCL), 108 (HCL) (3)	MW-69	S: 4/12/2006 15:00		--
Y2FX2	Ground Water/ Greg Nagle	L/G	PEST (21)	124 (Ice Only), 125 (Ice Only), 126 (Ice Only), 127 (Ice Only), 128 (Ice Only), 129 (Ice Only) (6)	NZ-69	S: 4/11/2006 11:10		--
Y2FX4	Field QC/ Greg Nagle	L/G	VOA (21)	145 (HCL), 146 (HCL), 147 (HCL) (3)	04112006TB	S: 4/11/2006 15:15		Trip Blank

Shipment for Case Complete? N	**Sample(s) to be used for laboratory QC:** Y2FX2	**Additional Sampler Signature(s):**	**Chain of Custody Seal Number:**
Analysis Key: PEST = CLP TCL Pesticide/PCBs, VOA = CLP TCL Volatiles	**Concentration:** L = Low, M = Low/Medium, H = High	**Type/Designate:** Composite = C, Grab = G	**Shipment Iced?**

TR Number: 9-265062414-041006-0003

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REGION COPY

EPA USEPA Contract Laboratory Program
Organic Traffic Report & Chain of Custody Record

Case No: 35220
DAS No:

R

Region:	9	Date Shipped:	4/10/2006
Project Code:		Carrier Name:	FedEx
Account Code:		Airbill:	8451 9856 9771
CERCLIS ID:	CA2570024453	Shipped to:	A4 Scientific 1544 Sawdust Road Suite 505 The Woodlands TX 77380 (281) 292-5277
Spill ID:	Q7		
Site Name/State:	George Air Force Base/CA		
Project Leader:	Greg Nagle		
Action:	Combined RI/FS		
Sampling Co:	EPA Region 9 Laboratory		

Chain of Custody Record		Sampler Signature:	
Relinquished By	(Date / Time)	Received By	(Date / Time)
1			
2			
3			
4			

ORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME	INORGANIC SAMPLE No.	QC Type
Y2FX3	Field QC/ Greg Nagle	L/G	VOA (21)	142 (HCL), 143 (HCL), 144 (HCL) (3)	04102006TB	S: 4/10/2006 13:30		Trip Blank

Shipment for Case Complete? N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key: VOA = CLP TCL Volatiles	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____

TR Number: 9-265062414-041106-0002

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EPA USEPA Contract Laboratory Program
Organic Traffic Report & Chain of Custody Record

Case No: 35220 **R**
DAS No:

Region:	9	Date Shipped:	4/12/2006
Project Code:		Carrier Name:	FedEx
Account Code:		Airbill:	8451 9856 9808
CERCLIS ID:	CA2570024453	Shipped to:	A4 Scientific 1544 Sawdust Road Suite 505 The Woodlands TX 77380 (281) 292-5277
Spill ID:	Q7		
Site Name/State:	George Air Force Base/CA		
Project Leader:	Greg Nagle		
Action:	Combined RI/FS		
Sampling Co:	EPA Region 9 Laboratory		

Chain of Custody Record

Relinquished By	(Date / Time)	Received By	(Date / Time)
1			
2			
3			
4			

Sampler Signature:

ORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		INORGANIC SAMPLE No.	QC Type
Y2FW7	Ground Water/ Greg Nagle	M/G	VOA (21)	100 (HCL), 101 (HCL), 102 (HCL) (3)	NZ-27	S: 4/12/2006	12:25		–
Y2FX0	Ground Water/ Greg Nagle	M/G	VOA (21)	109 (HCL), 110 (HCL), 111 (HCL) (3)	MW-49	S: 4/12/2006	15:15		–
Y2FX5	Field QC/ Greg Nagle	L/G	VOA (21)	148 (HCL), 149 (HCL), 150 (HCL) (3)	04122006TB	S: 4/12/2006	15:00		Trip Blank
Y2FX6	Ground Water/ Greg Nagle	L/G	VOA (21)	155 (HCL), 156 (HCL), 157 (HCL) (3)	MW-200	S: 4/12/2006	14:00		PE
Y2FX7	Ground Water/ Greg Nagle	L/G	VOA (21)	139 (HCL), 140 (HCL), 141 (HCL) (3)	WZ-06	S: 4/12/2006	10:15		–

Shipment for Case Complete? N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key: VOA = GLP TCL Volatiles	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced?

TR Number: 9-265062414-041106-0003

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